

Appl. No. : 10/601,147  
Filed : June 19, 2003

### AMENDMENTS TO THE DRAWINGS

The Examiner stated that Figure 2 and Figure 3 are inadequate and new corrected drawings are required in this application. In response, Applicants are submitting herewith replacement drawings of Figures 1, 2 and 3 which formalize the originally filed figures. No new matter has been added.

The Examiner objected to the drawings under 37 C.F.R. § 1.83(a) because the drawings must show every feature of the invention specified in the claims. In particular, the Examiner notes that the drawings do not illustrate a wavelength demultiplexing device as set forth in Claims 13 and 28. Applicants respectfully submit that the wavelength demultiplexing device is one example of an optoelectronic device 102 shown in Figure 1. Thus, claims directed to the wavelength demultiplexing device are supported by Figure 1.

The Examiner also objected to the drawings because Figure 3 shows a grating coupler 303 residing on a lower substrate while Claims 1, 16, 31, 32, 37, 38 and 39 claim that an array of optical grating couplers reside on a first substrate and the first substrate is oriented in a parallel plane above the second substrate. Applicants respectfully submit that the term "above" is relative and Figure 3 can be rotated to show the substrate with the grating couplers 303 above the substrate with the optical devices 304. Thus, Figure 3 shows the substrate with the grating couplers 303 above or below the substrate with the optical devices 304 depending on the orientation of the page.

In light of the above discussion, Applicants respectfully request the Examiner to withdraw her objections to the drawings.

Attachment: Replacement Sheets 1/3, 2/3 and 3/3.

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## **REMARKS**

Claims 1-14 and 16-40 are pending in this application. The Examiner rejected Claims 1-14 and 16-40. In particular, the Examiner objected to Claim 32 for formalistic reasons. The Examiner rejected Claims 1-14 and 16-31 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,568,574 issued to Tanguay, Jr. et al. ("the Tanguay patent"). The Examiner also rejected Claims 32-36 under 35 U.S.C. § 103(a) as being unpatentable over the Tanguay patent in view of U.S. Patent No. 5,285,258 issued to Kamon ("the Kamon patent") and U.S. Patent No. 6,318,909 issued to Giboney et al. ("the Giboney patent"). Finally, the Examiner rejected Claims 37-40 under 35 U.S.C. § 103(a) as being unpatentable over the Tanguay patent in view of the specification.

By this amendment, Applicants have amended Claims 1, 4, 16, 17, 19, 31, 32 and 37-40. Reconsideration of the application, as amended, is respectfully requested.

### **I. RESPONSE TO DRAWING OBJECTIONS**

The Examiner objected to the drawings because Figure 2 and Figure 3 are inadequate. In response, Applicants have formalize the originally filed figures as set forth in the above section entitled "AMENDMENTS TO THE DRAWINGS." Applicants respectfully request that the objections to the drawings be withdrawn.

### **II. OBJECTIONS TO CLAIM 32**

The Examiner objected to Claim 32 for formalistic reasons. The Examiner stated that some of the recitations lacked antecedent basis. In response, Applicants have amended Claim 32 to provide antecedent basis for the recitations.

### **III. REJECTION OF CLAIMS 1-14 AND 16-31 UNDER 35 U.S.C. § 102(e)**

The Examiner rejected Claims 1-14 and 16-31 under 35 U.S.C. § 102(e) as being anticipated by the Tanguay patent. In view of the above claim amendments and the following discussion, Applicants respectfully traverse this rejection.

The Tanguay patent does not teach each of the limitations recited in these claims. For example, the Tanguay patent does not teach or suggest "an array of optical grating couplers fabricated on a first substrate comprising silicon" as recited in Claim 1.

Claim 16, as amended, recites: "a plurality of optical grating couplers fabricated on a first substrate comprising silicon; and a plurality of optical devices fabricated on a second

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substrate,... wherein the first substrate is positioned above the second substrate such that the plurality of optical grating couplers and the plurality of optical devices are positioned between the first substrate and the second substrate...” Applicants respectfully submit that the Tanguay patent fails to disclose such features. For example, the Tanguay patent discloses outcoupling gratings 16a, 16b on a first substrate and associated modulator elements 30a, 30b on a second substrate. However, the two substrates are positioned such that the associated modulator elements 30a, 30b face outward and only the outcoupling gratings 16a, 16b are between the first substrate and the second substrate. Thus, the Tanguay patent does not show a structure with such features as recited in Claim 16.

Claim 31, as amended, recites: “an array of optical grating couplers formed on a first substrate; and an array of optical devices formed on a second substrate, the first substrate being disposed above the second substrate so that the array of optical grating couplers and the array of optical devices are positioned between the first and second substrates.” The Tanguay patent does not disclose such features.

Claims 2-14, which depend from Claim 1, are believed to be patentable for the same reasons articulated above with respect to Claim 1 and because of the additional features recited therein. Claims 17-30, which depend from Claim 16, are believed to be patentable for the same reasons articulated above with respect to Claim 6 and because of the additional features recited therein.

#### **IV. REJECTION OF CLAIMS 32-36 UNDER 35 U.S.C. § 103(a)**

The Examiner rejected Claims 32-36 under 35 U.S.C. § 103(a) as being unpatentable over the Tanguay patent in view of the Kamon patent and the Giboney patent. Claim 32, as amended, recites: “[a] method for optically coupling an array of optical devices formed on a first substrate to an array of optical grating couplers formed on a second substrate.” Claim 32 recites that “the first substrate is above the second substrate with the array of optical grating couplers and the array of optical devices therebetween, wherein the second substrate is a silicon or a silicon on insulator substrate.” Applicants respectfully assert that none of the cited art teaches the above-recited features of Claim 32, along with the remaining features of Claim 32.

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Claims 33-36, which depend from Claim 32, are believed to be patentable for the same reasons articulated above with respect to Claim 32, and because of the additional features recited therein.

**V. REJECTION OF CLAIMS 37-40 UNDER 35 U.S.C. § 103(a)**

The Examiner rejected Claims 37-40 under 35 U.S.C. § 103(a) as being unpatentable over the Tanguay patent in view of the specification. In view of the above claim amendments and the following discussion, Applicants respectfully traverse this rejection.

Claim 37, as amended, recites: "an array of optical grating couplers on [a] second substrate comprising silicon." Claim 38, as amended, recites: "an array of optical grating couplers on a second substrate comprising silicon." Claim 39, as amended, recites: "an array of optical grating couplers on a silicon substrate." The Tanguay patent fails to disclose these features recited in Claims 37-39.

Claim 40 depend from Claim 32 and is believed to be patentable for the same reasons articulated above with respect to Claim 32 and because of the additional features recited therein.


**VI. CONCLUSION**

Applicants have endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above amendments and remarks, reconsideration and withdrawal of the outstanding rejections is respectfully requested. If the Examiner has any questions which may be answered by telephone, she is invited to call the undersigned directly.

Respectfully submitted,

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